**General Certificate of Secondary Education
June 2012**

**Design and Technology: 45602
Resistant Materials**

(Specification 4560)

Unit 2: Design and Making Practice

Report on the Examination

This is the second year of certification of this very popular Design and Technology subject. Candidates across the country, and those working in overseas centres, were able to complete the design and manufacture of individual products from the twelve controlled assessment tasks.

An increasing number of candidates submitted their design work electronically, with PowerPoint being the software of choice for most. It was pleasing to see that centres were encouraging candidates to adopt a range of techniques and strategies for success, including those suggested in AQA support materials and feedback meetings. The best candidates were able to produce innovative products, backed up by comprehensive, detailed designing and evaluation.

All twelve design tasks were tackled, 'eco jewellery' being the least popular, and docking stations and lamps being the most commonly selected products. Once again, there were very few requests to contextualise the tasks, and in most of these cases, the brief suggested could be accommodated as merely 'focussing in' the design within the existing controlled assessment tasks.

Some centres offered all twelve design tasks, whereas others limited choice. Even where only one task was undertaken by all the candidates from a centre, there were still opportunities for creativity and individuality. In a few centres, limiting choice to one task did lead to very similar products designed and made.

Centres are reminded that the controlled assessment tasks for submission in 2013 and 2014 have been revised slightly in DT:RMT

Criterion 1 Investigating the design context.

Many candidates successfully analysed the task and identified relevant areas of research that would help them to design an appropriate product. Their research work was kept concise, relevant and very focussed, and it directly influenced the design of the product. Many started by profiling their client or target market, and this helped them to keep the rest of their research focussed. The client was consulted throughout the design process in the best examples seen.

A significant number of candidates were less focussed in their investigation of the context, often missing a client profile completely, then gathering information that wasn't always relevant, and often did not influence the design of the product in any way.

A significant number of candidates successfully carried out research at relevant points throughout the designing of their product.

All candidates need to keep their research, brief, focussed and use it to directly influence their design ideas. This section attracts 8 marks out of 90; a number of candidates spent a disproportionate amount of time on this aspect of the task.

Criterion 2. Development of design proposals (including modelling)

Moderators were delighted to see an increasing number of candidates were using a range of strategies to produce creative solutions to their design briefs. Photographs of other unrelated products or items from nature were used to inspire creativity, as well as scruffitti and similar techniques. Most candidates conveyed initial ideas through sketches, although a

small number successfully used CAD from the outset. Other candidates used modelling extensively, both to convey initial ideas and to develop ideas. Often a number of models were made, each being photographed, printed and then sketched on and around with annotation. This technique allowed candidates to develop their ideas very thoroughly.

Google sketchup is proving increasingly popular for CAD with candidates, possibly because of its user friendly approach and the fact that it is free to download. 2D Design was also popular, with an increasing number of users making use of the 3D facility with this programme. Coral Draw was also popular to produce designs for laser cutters. Where laser cutters were used, few candidates evidenced knowledge of settings for different materials; a screen dump is an easy way to achieve this.

A significant number of candidates produced a range of initial ideas, and then a final idea, but did not show how the initial concepts had evolved, been refined, improved or constructional information detailed. There was no evidence in these folders showing why materials had been selected, the consideration of alternative methods of joining shaping and forming them and details of working out sizes of parts etc.

For the manufacturing specification, moderators are looking for candidates to try to provide enough information for a competent third party to be able to make the product. This could be conveyed successfully through some sort of formal drawing/sketch/CAD with measurements, a cutting list and a plan of making (flowcharts were a popular and successful way of producing a plan of making). Other approaches can also convey the same information. Many candidates also produced a diary for making which complimented the plans but did little to enhance the development unless it highlighted areas where problems had led to a modification.

As many candidates skills in CAD increases, we are seeing a growing number of examples of exploded drawings showing all the parts of a product, often with dimensions on each part.

Social, moral, environmental and sustainable aspects for criterion 2 were generally either not addressed, weak or shown as a generic page without specific focus.

Criterion 3 Making

A huge variety of products of all shapes and sizes were seen. In the top mark band, work was excellent quality and demanding, or creative and demanding (or both).

Wood again proved to be the most popular material in which to work, increasingly used in combination with other materials, particularly where there was access to CAD CAM equipment. Wood and wood based products were also being used in a very creative manner by many candidates, lamination of curved parts proving very popular and successful in achieving marks in the higher bands.

Plastics were the second most commonly family of materials, with acrylic dominant, particularly for laser cut work.

Metals were used by a relatively small number of candidates.

Composite and smart materials are yet to feature in any quantity.

It was pleasing to see the high number of innovative, creative products designed

Criterion 4 Testing and evaluation

Testing and evaluation was improved on the situation of the first year of certification of this course. A greater number of candidates have realised the importance of this aspect of the design process, and the fact that it carries 12 marks out of 90.

In the work of many candidates, there was evidence of useful testing of the product in its intended environment, target market feedback, and testing against the design criteria. There was also justification given for modifications to the design, together with suggestions for how the product would need to be modified for commercial production. The best scoring candidates were also evaluating their designs throughout the development process and seeking third party opinions of their designs.

Candidates who did not score highly on this section, missed many aspects of the above paragraph.

Criterion 5 Communication

Centres were generally accurate in their assessment for this criterion reflecting a good understanding of the requirements.

Conducting controlled assessment tasks.

Centres are reminded of the need to restrict feedback to candidates to generic feedback, i.e. feedback given to the whole group. Detailed guidance on conducting the controlled assessment can be downloaded from e-AQA on the secure area of the AQA website. It follows the controlled assessment tasks. If you have no access to e-AQA, register, or speak to your examinations officer. Whilst logged on to the site, you will also be able to access the very useful enhanced results analysis service, enabling you to analyse the performance of your candidates (once results are published).

The exemplar materials produced for training meetings over the last few years have been used in many centres to allow pupils to self assess their work as it progresses.

Some centres have made use of scaffolding, frameworks, templates, etc to assist pupils in the production of their controlled assessment work. Whilst these prove useful in ensuring all candidates have some response to all assessment objectives, they have been seen to stifle the creativity of middle and higher ability candidates.

Administration of assessments

It is evident that exemplar work produced by AQA had been used to assist assessments; the vast majority of centres were within tolerance with their marks. Where centre assessments were inaccurate, it was usually most apparent in criteria 2 and/or 3. In development of design proposals (criterion 2), where centres were lenient in their assessments, it was often because the product designed lacked detail, in particular of sizes and how it would be constructed. Sometimes this information did appear, but without the developmental evidence to support the decisions made. Where making marks (criterion 3) were over assessed, it was often because the outcomes awarded the highest marks lacked the quality of finish and construction necessary to justify those marks.

The Candidate Record Form (CRF) was well used by many centres to explain the marks awarded. It was particularly useful to clarify if any help had been given to candidates e.g. routing, welding, setting up machines etc.

Most centres were prompt in the dispatch of marks and requested folders. A few centres did not realise that they need to send all folders where there were 20 candidates or less.

Moderators did spot a number of data errors, e.g. transfer of marks to the centre mark sheet, or addition errors on candidate record forms. Care needs to be taken with this.

Many centres were very helpful in providing clear photographs of outcomes; this helps the moderator when assessing criteria 3 (Making).

Few centres sent narrated videos of outcomes, although a few candidates included videos as part of their evaluation of the product.

Mark Ranges and Award of Grades

For grade boundaries, please click the following link:
www.aqa.org.uk/over/stat.html

For the UMS conversion calculator, please click the following link:
www.aqa.org.uk/umsconversion